

Lamar, Missouri
Water Supply Study
City Lake

Lamar is in west central Missouri, in Barton County.

Lamar water supply comes from a city owned lake located about 1.5 miles Southeast of Lamar on a tributary to Spring River. During drought periods their water supply is supplemented by a well.

The drainage area of the lake is 4.77 square miles.

Average annual rainfall is 37.2 inches. Annual rainfall for 1953 through 1957 is 21.45, 35.52, 34.61, 23.14, and 48.20 inches.

Lamar Lake analysis consisted of using the NRCS's computer program "RESOP". This program analyses remaining stored water at the end of each month by summing gains and losses.

Two analysis were made:

1. First run was with the 2001 demand.
2. The lake was analyzed for the optimum daily use without emptying the lake during the evaluation period.

Following is the data procedures and consideration for input to the "RESOP" program.

STO-AREA Elevation-Storage and Elevation-Area data were determined from June 26, 2002 survey made by USGS.

Lamar Lake

Elevation (feet)	Area (acres)	Storage (ac-ft)	
870.0	0.73	0.54	
930.0	0.06	0.06	
932.0	0.14	0.26	
934.0	1.51	1.05	
936.0	8.43	10.39	
938.0	20.05	37.38	
940.0	36.18	93.37	
942.0	50.58	180.12	
944.0	65.53	296.15	
946.0	80.64	441.95	
948.0	95.73	617.85	
950.0	112.00	825.55	
952.0	125.97	1063.64	
954.0	142.38	1329.90	
955.7	156.37	1582.55	W.S. and Spillway Elev. on 5/22/02 (full pool)

LIMITS Full pool storage 1582 Ac.Ft.
 Minimum pool storage 35 Ac.Ft.

Starting storage was considered at full pool.

The drainage area of the lake is 4.77 square miles.

GENERAL	<p>The adjustment to convert from pan evaporation to lake evaporation was made for the control word EVAP. The factors were monthly values. As a result a factor of 100 was used.</p> <p>The record period of drought is in the 1950's. Analysis began in January 1951 and ended December 1959.</p>
SEEPAGE	The reservoir seepage varied from 0 seepage near empty to a maximum of 2.0 inches per month at full pool. The seepage rate is a best estimate based on history of the reservoir, soil type, material of the core of the dam and compaction of the earth fill. The material in the dam is compacted earth of clayey soils.
RAINFALL	Rainfall data came from the Lamar, Mo. rain gage for the period 1951 through 1959.
RUNOFF	<p>This is the runoff into the lake from its drainage area. Monthly runoff volumes in watershed inches were determined for the Cedar Creek Gage near Pleasant View.</p> <p>In cases where rainfall to runoff values did not appear reasonable, adjustments were made for that month by looking at individual rains and estimating antecedent moisture then, adjusting runoff based on NRCS's runoff curve numbers.</p>
EVAP.	Pan evaporation at the Lakeside gaging station was used as a base because it has data for year around evaporation. All other stations only measure data between April through November. Lakeside data was updated during these months with gage data from stations at New Franklin, and Columbia. Depending on the latest data for the station nearest to Lamar.
DEMAND	This was determined by city records. Lamar used a total of 175,144,800 gallons during 2001 for an average of 479,850 gallons per day.

Lamar, Missouri
Water Supply Study
City Lake
Storage Volume

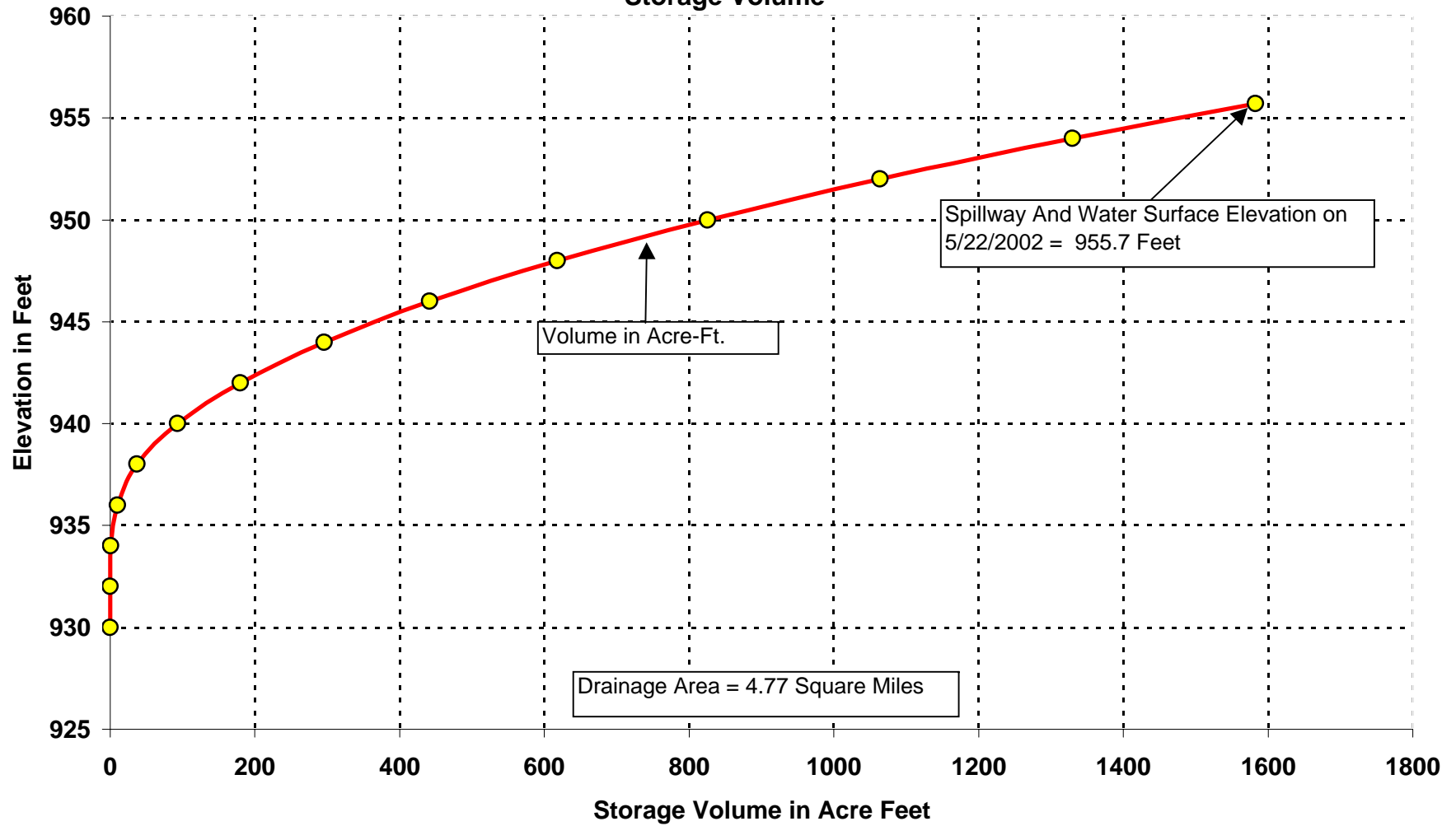


Figure 18.1.a

Lamar, Missouri

City Lake

Water Supply Study

City Lake

Surface Area

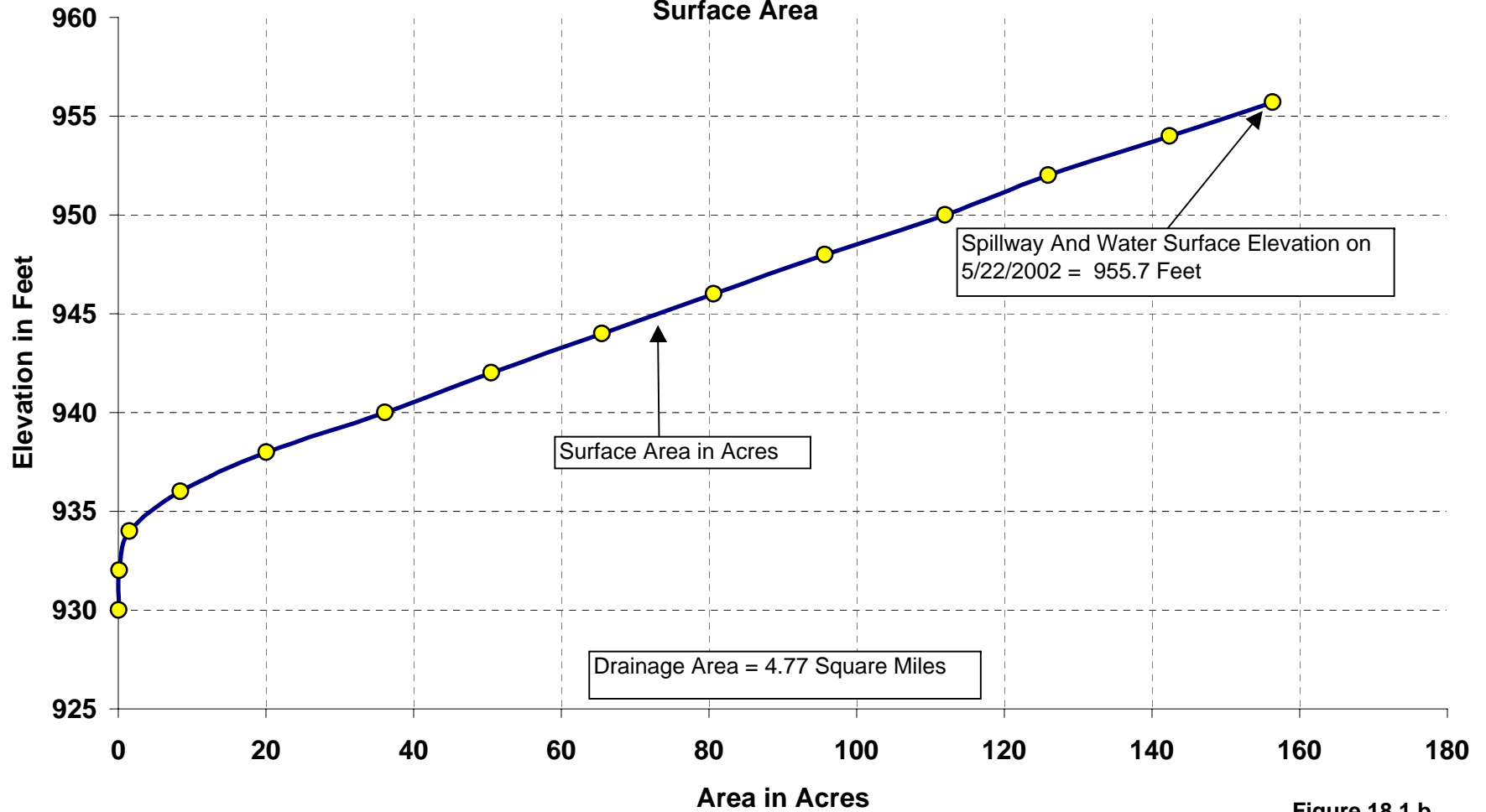


Figure 18.1.b

**Lamar, Mo.
City Lake
Water Supply Study
Lake Storage**

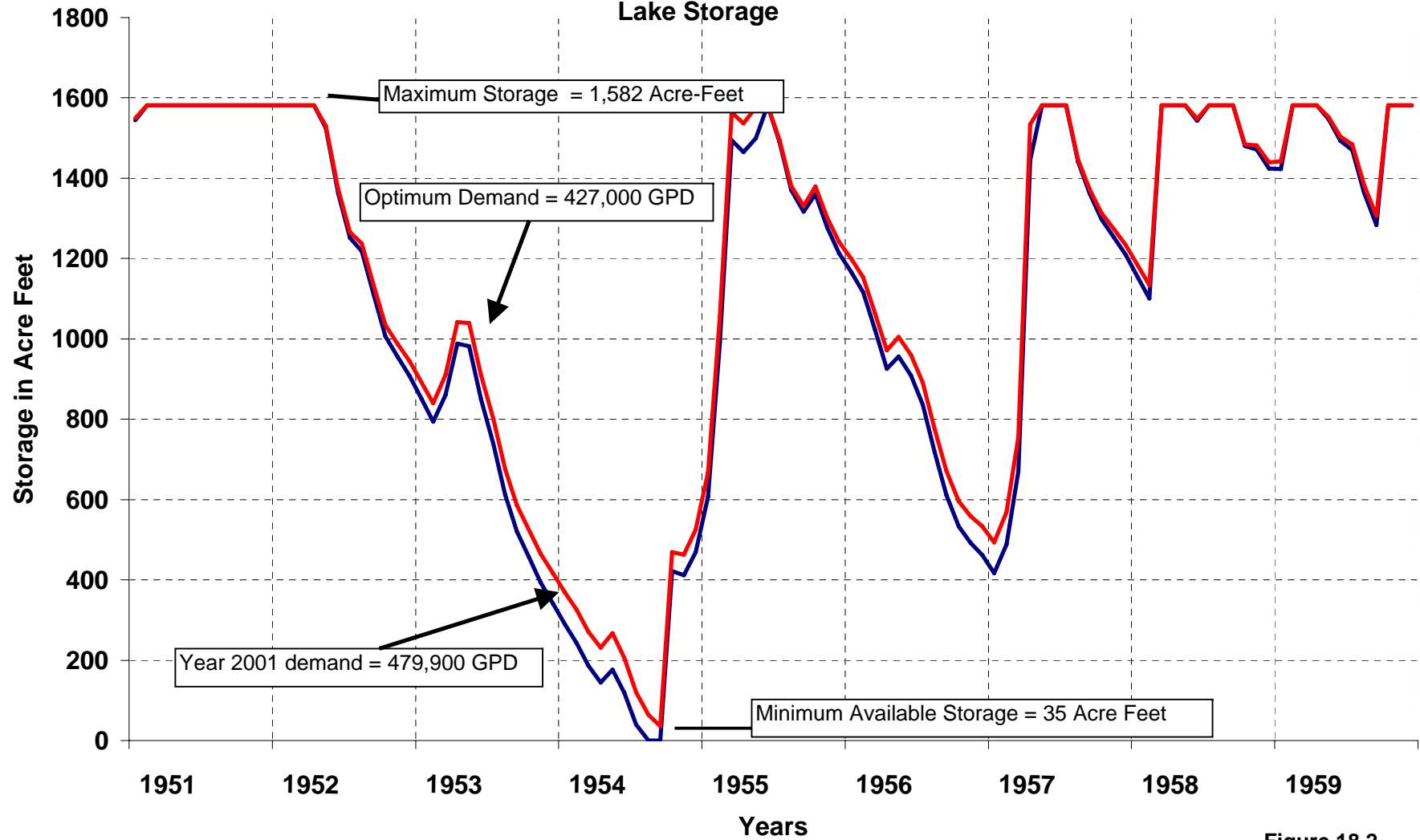


Figure 18.2

Lamar, Missouri
Water Supply Study
City Lake
Water Use

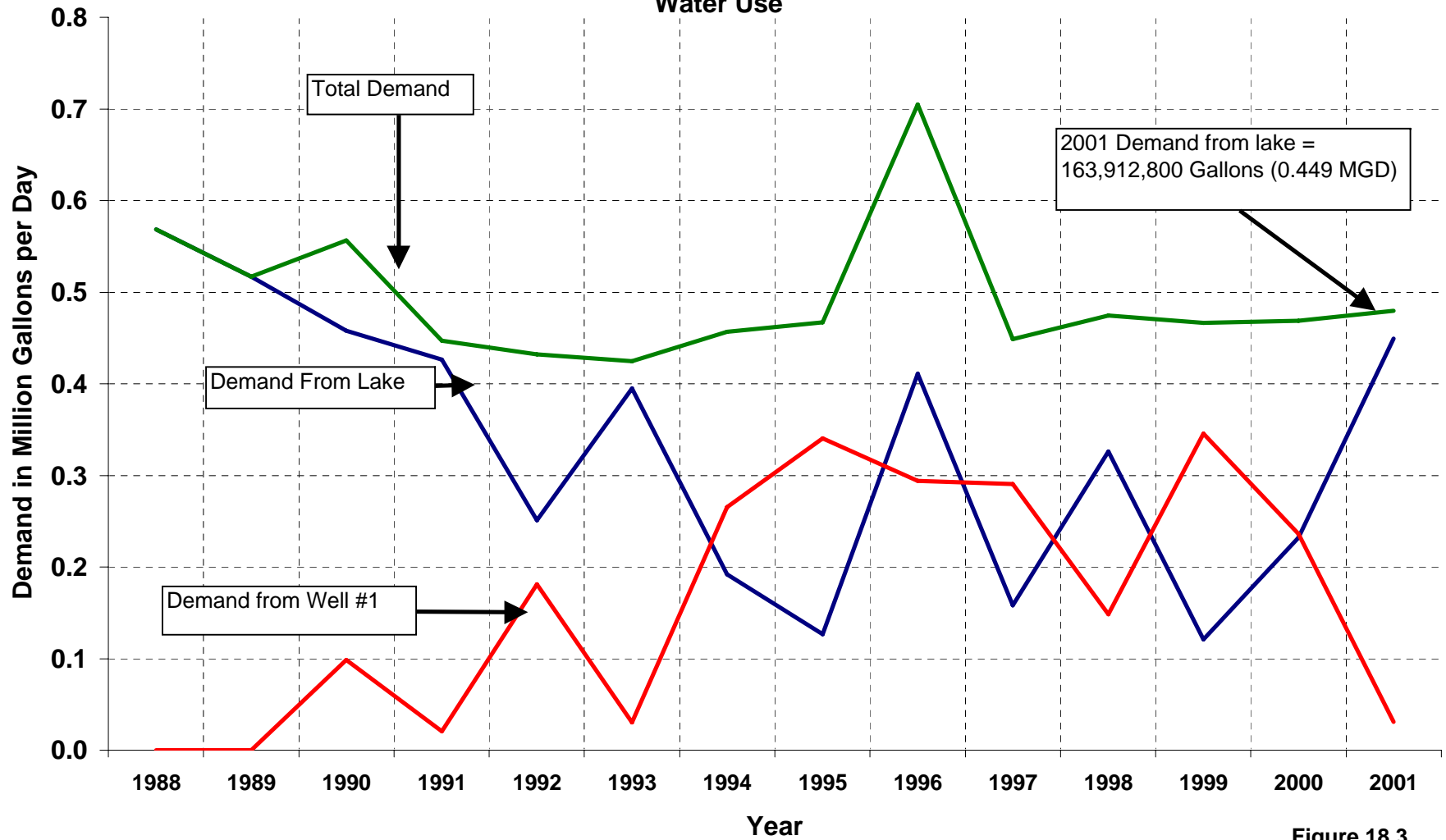
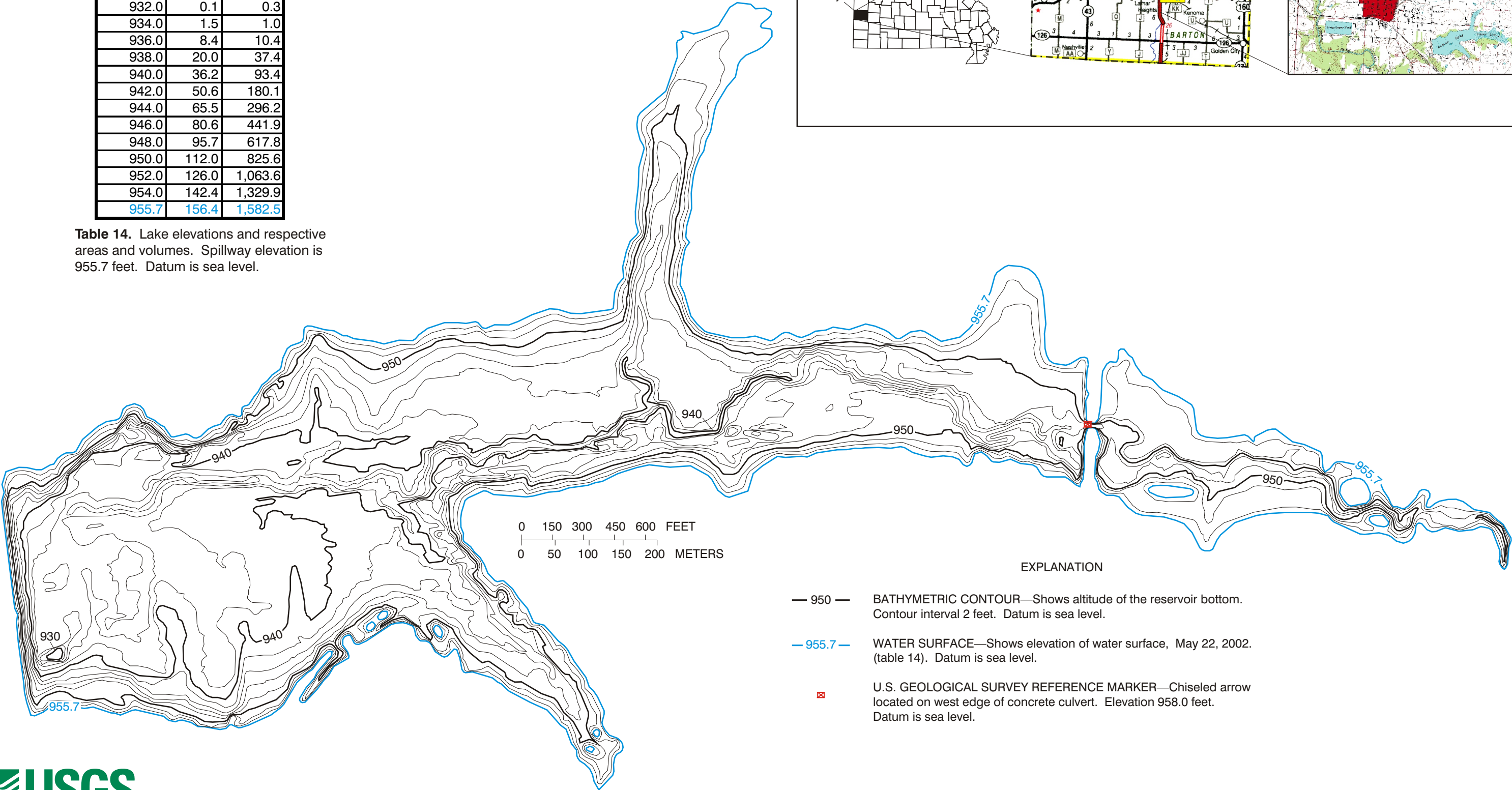
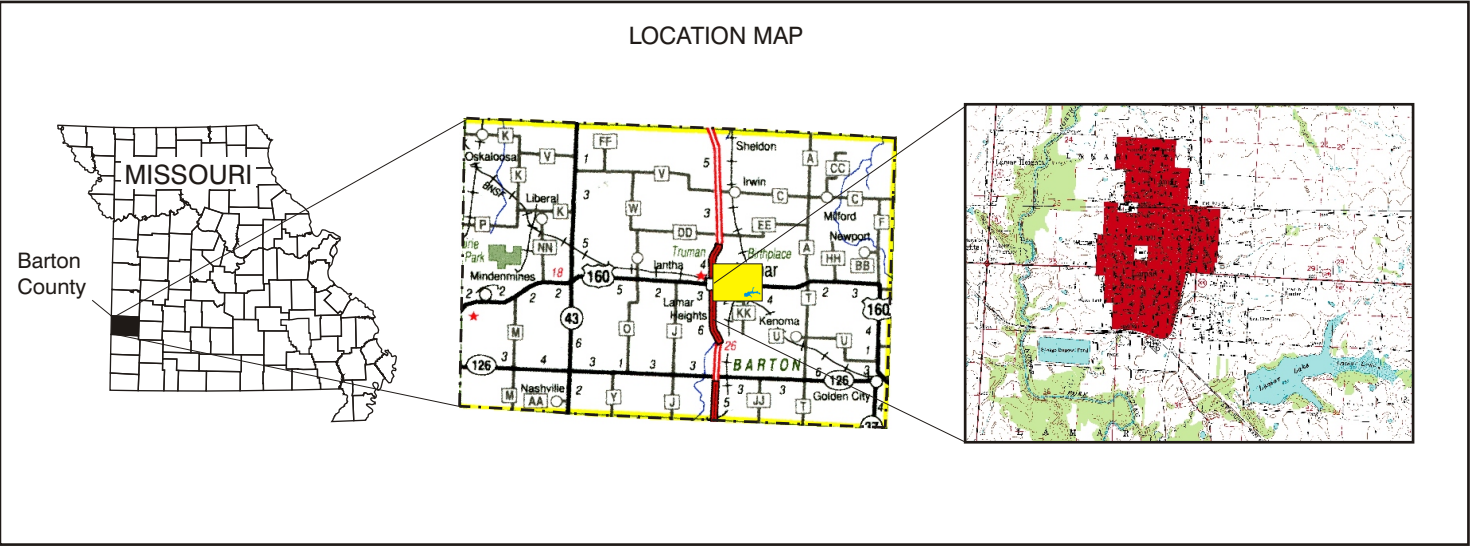


Figure 18.3

LAMAR LAKE

Elevation (feet)	Area (acres)	Volume (acre-ft)
930.0	0.1	0.1
932.0	0.1	0.3
934.0	1.5	1.0
936.0	8.4	10.4
938.0	20.0	37.4
940.0	36.2	93.4
942.0	50.6	180.1
944.0	65.5	296.2
946.0	80.6	441.9
948.0	95.7	617.8
950.0	112.0	825.6
952.0	126.0	1,063.6
954.0	142.4	1,329.9
955.7	156.4	1,582.5

Table 14. Lake elevations and respective areas and volumes. Spillway elevation is 955.7 feet. Datum is sea level.



- EXPLANATION
- 950 — BATHYMETRIC CONTOUR—Shows altitude of the reservoir bottom. Contour interval 2 feet. Datum is sea level.
 - 955.7 — WATER SURFACE—Shows elevation of water surface, May 22, 2002. (table 14). Datum is sea level.
 - ☒ U.S. GEOLOGICAL SURVEY REFERENCE MARKER—Chiseled arrow located on west edge of concrete culvert. Elevation 958.0 feet. Datum is sea level.

Figure 18.4 Bathymetric map and table of areas/volumes of Lamar Lake near Lamar, Missouri.